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EVALUATION OF THE IMPLEMENTATION OF OFFICE365 PROGRAM FOR ONLINE TUTORIAL DELIVERY OF A COLLEGE MATHEMATICS COURSE

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Abstract

This study is intended to improve the distance learning online tutorial services for students who participate in online tutorial offered by Universitas Terbuka (UT), specifically courses offered by Department of Mathematics, School of Mathematics and Natural Science. Since 2013 UT has offered the online tutorial services that integrate the Office365 program and the Learning Management System MOODLE. Office365 program can support the distance learning activities, for example the availability of digital interactive whiteboard and webinar can support synchronous interactions between students and tutor. These two features of Office365 can facilitate the explanation of mathematical concepts, equations, and symbols which are not supported by MOODLE. The Mathematics department adds the graphic tablet which is connected to the PC or laptop for the tutor to better utilized the digital interactive whiteboard feature. This study utilizes a research and development approach especially the ADDIE (Analyze, Design, Development, Implementation and Evaluation) model in developing the improved online tutorial program. The aim of this study is to apply the features of Office365 in line with the MOODLE system. The two programs are observed when offered the online tutorial of Introductory to Mathematic course. The result of the evaluation of the trial is that for the webinar and the interactive whiteboard features, students say that they are beneficial to them in getting the explanation about introductory mathematics concepts. However, the obstacle to utilize the program smoothly is internet connection that is up and down, and the limit time of the webinar. In the future the webinar time will be increase to 4 times instead of three times, on Saturdays or Sundays in the two months of the online tutorial.

Keywords: Office365, MOODLE, Mathematics online learning

Introduction

Mathematics Study Programme is a field of study that use many different notation to explain concepts and mathematical problem solving. Although there are applications to write the notation like equation, mathematical equations or inequalities, the academic staff at Mathematics Departement still prefer to use handwriting to explain mathematics problem solving, including to answer student questions via email or online tutorials. The equation applications typically used to make printed teaching materials (books subject matter) and non-print (initiation tutorial, presentation materials, and materials for the television program), which is made to explain the specific competencies. academic staff and students prefer to use handwriting. This is due to explain the concept of Mathematics with handwriting is faster than using the equation applications. Therefore the necessary facilities that can accommodate the handwriting in delivering learning mathematics.

Since 2013, Indonesia Open University (UT) provides learning facilities (tutorial) through Office 365 to complete the online tutorials through MOODLE. However, the use of both of

these applications is not maximized because many academic staff who do not know how to integrate MOODLE and Office365. The purpose of this study is to apply the features of Office365 in line with the MOODLE system. Thus, the results of this study will be useful for online learning mathematics. Office365 has been set by the UT to be used by the academic staff and students.

Literature Review

UT system implementing distance education by opening up the possibility of face-to-face tutorials and online tutorials. All courses will apply this, including mathematics study programme in the School of Mathematics and Natural Science. Students are expected to have the ability to learn independently and ability to use technology to be able to follow tutorials online so they can get help to learn optimally. Face to face tutorials will only be offered in regional office of UT. This support will able to if the number of students participating in the tutorial at least 20 people. Because mathematics students enrolled in each regional office of UT generally just a little then face-to-face tutorials are not held. Thus students should follow the online tutorials if you want to get tutoring from tutors.

Students who choose mathematics study programme is considered to have the basic ability of middle school mathematics and is delighted with the mathematics, so choose this study programme. The fact that not all students who choose mathematics study programme is ready with self-learning.

George Harrison Hendrick III (2012) research community college students in the United States which take the matriculation course Basic Mathematics, before taking credit courses. He shows that there is one thing that can predict their success in future learning, namely mathematical self-efficacy. This term describes the factors for success in mathematics attitude, belief in the ability to perform the duties of Mathematics, motivation, and locus of control. Mathematics self-efficacy can also shed light on the affective factors of academic self-concepts, math anxiety, test anxiety, and self-esteem. UT accept students without entrance test, and generally is not a smart student and comes from a good school. Students choose UT because they are not able to participate in face-to-face learning. Many of UT students who entered the mathematics study programme maybe is not ready to self-learning on mathematics study programme and also do not quite have the basic ability to survive in this study programme. To ensure that all students can last up to pass the required service strategy both academic and administrative, such that although students should learn remotely, but they do not feel alone. They were greeted by a tutor for academic affairs lectures, and by counselors for administrative affairs and other matters that may be experienced. This service has been made in mathematics study programme.

The results of various studies on the implementation of the Online Tutorial at UT shows the following. In a study of online tutorials at Biology Education showed that students considered active and very active tend to have better value final exam compared with participants with less category and inactive (Wahyuningsih and Setiasih, 2013). An analysis of student learning activities in regional office UT in Padang showed that the factors that influence the learning activity is participating online tutorials, access to learning services and buy books online bookstore. While learning achievement is influenced by the service learning and teaching materials (Andriansyah, Fatimah, Harnon, 2012).

Research on the interaction patterns and perceptions of students in an online tutorial on two courses in study programme Physical Education (Herath, 2012) shows a positive value for the interaction with the material and assignments on-line tutorials, because they feel the material online tutorials can help answer tutorial tasks, in addition to the reference or references in the online tutorial material derived from other sources, not just from any module. Students really like the active tutors motivate students and give feedback as soon as the task is sent by the student. Students are most like the online discussion through discussion forums. But they are difficult to participate in openmeeting or openchatting available on-line tutorial program for internet access that can not be continuous or frequent intermittent.

Of the three studies, it can be concluded that the activity of the students followed an online tutorial is strongly influenced by the material online tutorials and liveliness and caring tutors facilitate student interaction in learning courses at UT.

Hannover conduct research on innovative practices by various universities in the United States in improving student performance on the College Level Mathematics (such as College Calculus I & II, College Algebra and Trigonometry) (2011). Various institutions are switching from teaching methods centered on academic staff to student-centered learning methods such as active learning collaborative and cooperative. Learning is supported by the integration of technology into learning math mathematics such as the use of interactive software that allows students to interact with active learning materials Mathematics. Utilization of this software is the main cause student learning is done in the computer lab individually and independently or in a small group of academic.Staf not give lectures on a large class of continuously but met with a small group of students to overcome specific difficulties. So there is a tendency to train students to learn independently with the use of technology. Research on teaching strategies of the professor of Mathematics in the United States showed that the general strategy that they do is give lectures were well prepared, as well as problem-solving exercises and practice tests (Finn, 2010).

All subjects mathematics study programme has a book subject matter developed in a certain way. The subject matter of this book is the result of collaboration between the developers of learning materials in mathematics study programme with the author of the material that is generally professor of Mathematics from various leading public universities in Indonesia for mathematics study programme. Thus mathematics within each course have been prepared in a manner to easy for self-learning students.

Methodologies

The design of this study is the ADDIE Model. Figure 1 shows that the development of research focused on an important problem, in this case the development of mathematics tutor ability to integrate Office365 into the online tutorial courses respectively. Especially for this research, trials conducted in the course Introduction to Mathematics.

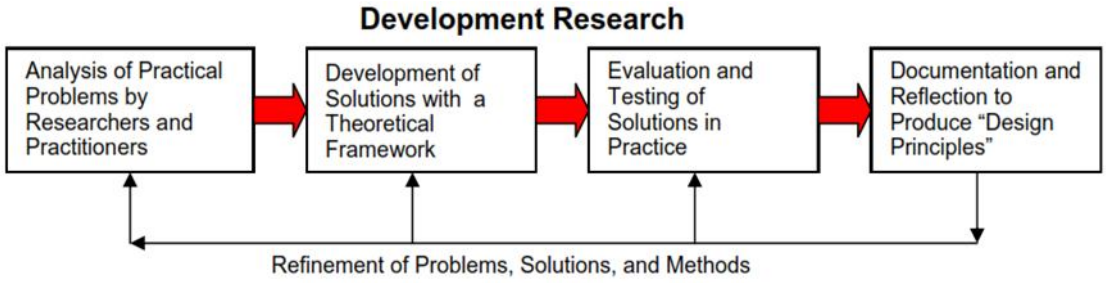

Figure 1: Stages of Development Research

Stages of development of the program are as follows:.

a. Analysis. The analysis was performed to study the problems in mathematics study programme, Office365 and MOODLE features, and features mathematics learning. This analysis is done by making instruments for interviews with expert MOODLE and Office365.
b. Design. After the analysis, then prepared a draft training for the students in face-to-face meeting. Result of this training is the guide of webinar through Office365 for students.
c. Development. Prepare materials online tutorials that integrate Office365 and MOODLE based online tutorials offered at 2014.2, which for the course Introduction to Mathematics.
d. Implementation. After all the training materials prepared, it done to trial webinar.

e. Evaluation. Evaluation of the results of the training conducted at 2014.2 Online Tutorial to see Office365 effectiveness in improving the online tutorial course Introduction to Mathematics. Points to consider is the easy of use of this application by the tutors and students and also need equipment to run this application.

This research was conducted in study programme Mathematics at UT Center and focused on subjects Introduction Mathematics. Data were collected by using the instruments to survey of students about the difficulties, obstacles and benefits of the program Office365 in enriching the online tutorial.

Results and Discussion

a. *Analysis*. To find out the features Office365 conducted interviews with experts MOODLE and Office365. From interviews with experts MOODLE and Office365, note that:
   - MOODLE can be integrated with Office365
   - Features Office365 can be used for job at UT and communication with students
   - Tutorial through Office365 is one form of webinars (online meetings)
   - Submission of materials can mathematics through Office365, because there whiteboard features that can be used as a medium of writing. However, to be more flexible it is necessary to add the equipment that is Graphic Tablet.

   For mathematics study programme, this application is useful to write on the board and this can be shared digitally via computer tutors with other computer synchronously (at the same time). Thus, students in Mathematics will be involved in the learning interaction to one subject, namely Introduction to Mathematics. Based on the results of the interview, then do the next research step, which makes the design of training and test design webinar with students.

b. *Design*. After the analysis we then arranged the training together with the students in face-to-face meeting for 1 day. Training materials are:
   - Introduction Office365 and MOODLE features suitable for the learning interaction
   - Introduction Office365 and MOODLE features that match the learning of mathematics
   - Installation of devices Graphic Tablet and how to use them
   - Testing and practice doing webinars

c. *Development*. Previous set of courses that implements Office365 in the online tutorial. The course is MATA4101 Introduction to Mathematics. Integration Office365 and MOODLE in online tutorial course was conducted at 2014.2. This course selected based on consideration of (1) the material of this course is quite simple, (2) This course is offered in semester 1, (3) students who register this course at 2014.2 pretty much is 117 students. Strategies undertaken in order to test this works is:
   - Adding tutor of online tutorials Introduction to Mathematics, which was originally at 2014.1 only one person, then at 2014.2 to 2 people.
   - Provide information in the online tutorials MATA4101 Introduction to Mathematics and online community forums that will be held webinars.
   - Develop implementation schedule webinars 3 times that become part of the online tutorial.

     Preparing equipment such webinar webcam, headset, and Graphic Tab.

d. *Implementation*. Trial webinar with students followed by 7 of the 17 students who claim to participate in this activity. Participants from Jakarta, Bogor, Bandung, and Malang. Trialling webinar run smoothly because of the webinar this time tutors and students to communicate via chat, audio, and video. Tutor tested this webinar using wifi access at home.

- In the webinar I attended by 14 of the 45 students were invited. Tutor implement webinar from home and use wifi access. The first meeting of this webinar can be recorded even though sometimes broken connection with internet access. The results can be seen in https://www.youtube.com/watch?v=g5urT6uTBDU recording.
- According to instructor training, the problem arises because the internet connection using wifi so it is advisable to use the internet cable at the next meeting.
- Webinar II invited 48 students. Tutor implement webinar using the PC in the office UT Center connected with the internet cable. Implementation of this second webinar can not run smoothly. Internet access at the time was very slow to start webinar just can not be done. Internet access is down the cause of material online tutorials that will be discussed is delayed, so that will be a meeting agreed replacement Webinar II. Is also due to access difficulties aside because UT internet is down, probably because it was held on a weekday when internet usage is very high.
- Substitute Webinar II was held on Sunday. Webinar invitations sent to 48 students. Tutor implement webinar from home and connected to the internet cable. This replacement meeting was also unable to run smoothly. Internet access problems are intermittent cause replacement meeting also failed. This may be due in addition to the lack of good internet connection on that day, probably also due to the use of a webcam.
- Substitute well as implementation Webinar III was held on Saturday. Tutor implement webinar from home and connected to the internet cable as well. Webinar this time also failed despite not using a webcam, this is due to intermittent internet access also.

e. *Evaluation*. The result of the evaluation of the trial is that for the webinar and the interactive whiteboard features, students say that they are beneficial to them in getting the explanation about introductory mathematics concepts. However, the obstacle to utilize the program smoothly is internet connection that is up and down, and the limit time of the webinar. In the future the webinar time will be increase to 4 times instead of three times, on Saturdays or Sundays in the two months of the online tutorial

Conclusion and Suggestion

Based on the results of the implementation of training in the use of Office 365 were carried out in the form of webinars, it can be concluded that:

- Implementation of this webinar is very dependent on the speed of the internet. Of five attempts implementation webinars, only two-time webinars can be implemented. Successful Webinar was held at the home using wifi. While the three subsequent meetings failed due to problems with internet connection, although it have tried to do in the office.
- Integrating MOODLE and Office365 in this webinar to be especially useful for tutors and students, especially when describing the basic concepts of mathematics.
- This research has produced an interactive math learning model by using Office365 and MOODLE. Skills acquired mathematics academic staff in using Office365 and MOODLE can help students learn at study programme Mathematics more efficiently and effectively. Thus, in the long-term is expected to reduce the dropout students because of the difficulty to learn math.

From these results it is suggested the following:

- Graphic Tablets can be used with either if internet access is good. Graphic Tablets are used should be able to display the text in Graphic Tablets board so that implementation can be more convenient webinars.
- Mathematics study programme is expected to hold a webinar that is integrated with an online tutorial every two (2) weeks on Saturday / Sunday, and add courses that provide services webinar.

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